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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/807,093

03/22/2004

Paul Caprioli

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05/05/2006

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EXAMINER

MOLL, JESSE R

ART UNIT

PAPER NUMBER

2181

DATE MAILED: 05/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/807,093	Applicant(s) CAPRIOLI ET AL.	
	Examiner Jesse R. Moll	Art Unit 2181	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Supervisory
FRITZ FLEMING
PRIMARY EXAMINER 4/13/2006
GROUP 2100
Am 2181

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 20 April 2006.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-21 have been examined.

Acknowledgment of papers filed: oath, specification and drawings on March 22, 2004, and IDS on April 20, 2006. The papers filed have been placed on record.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Processor 100 (see paragraph 0023). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

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the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Double Patenting

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1-21 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-25 of copending Application No. 10/686,061. Although the conflicting claims are not identical, they are not patentably distinct from each other because the only limitations claimed in the current application which is not also claimed in application number 10/686,061 deal with determining whether to resume execution in the execute ahead mode if instructions are

deferred again in a deferred mode. If instructions are not deferred again during the deferred mode, the claims of application 10/686,061 claim the same thing as the current application. Additionally, if the instructions are in fact deferred, the processor claimed in application 10/686,061 always determines to resume execution in the execute ahead mode.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 5 and 14 recite the limitation "the launch point stall condition". There is insufficient antecedent basis for this limitation in the claim. Further, the limitation "(the unresolved data dependency or the non-data-dependent stall condition that originally caused the execute-ahead processor to exit the normal execution mode)" is unclear as to whether the limitation is merely an example of a launch point stall condition, or if it is intended to further limit the claim. Examiner suggests that the limitation be removed or "the launch point stall condition (the

unresolved data dependency or the non-data-dependent stall condition that originally caused the execute-ahead processor to exit the normal execution mode)" be replaced with "the unresolved data dependency".

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Chaudhry et al. (U.S. Patent Application Publication 2005/0081195 A1) herein referred to as Chaudhry.

8. Regarding claim 1, Chaudhry discloses a method for dynamically adjusting the aggressiveness of an execute-ahead processor, comprising: executing instructions in an execute-ahead mode (Execute-Ahead Mode 204; see fig. 2), wherein instructions that cannot be executed because of an unresolved data dependency are deferred, and

other non-deferred instructions are executed in program order (see paragraph 39), and wherein if a non-data-dependent stall condition is encountered, the execute-ahead processor enters a scout mode (Scout Mode 208; see fig. 2; see paragraph 43), wherein instructions are speculatively executed to prefetch future loads, but results are not committed to the architectural state of the execute-ahead processor (see paragraph 43, last 3 lines); if an unresolved data dependency is resolved during the execute-ahead mode, executing deferred instructions in a deferred mode (see paragraph 40, first 5 lines); wherein if some instructions are deferred again during the deferred mode (see paragraph 42), the method further comprises, determining whether to resume execution in the execute-ahead mode (the processor always to resume execution in the execute-ahead mode), if it is determined to do so, resuming execution in the execute-ahead mode, and otherwise resuming execution in a non-aggressive mode (it is never determined to do so).

Note that it is always determined to resume execution in the execute-ahead mode. Therefore, Therefore, the limitation "resuming execution in a non-aggressive mode" does not need to be met because it is never determined not to resume execution in the execute-ahead mode.

9. Regarding claim 2, Chaudhry discloses the method of claim 1, wherein resuming execution in the non-aggressive execution mode involves remaining in the deferred mode until all deferred instructions are executed and the execute-ahead processor

returns to a normal execution mode (it is never determined to do so; see above regarding claim 1).

10. Regarding claim 3, Chaudhry discloses the method of claim 1, wherein resuming execution in the non-aggressive mode involves resuming execution in a non-aggressive execute-ahead mode, wherein if a non-data-dependent stall condition is encountered, the execute-ahead processor does not enter the scout mode, but instead waits for the non-data-dependent stall condition to be resolved, or for an unresolved data dependency to return, before proceeding (it is never determined to do so; see above regarding claim 1).

11. Regarding claim 4, Chaudhry discloses the method of claim 1, wherein prior to executing instructions in execute-ahead mode, the method further comprises entering the execute-ahead mode (see paragraph 37, lines 1-3) by: issuing instructions for execution in program order during a normal execution mode (see paragraph 36); upon encountering an unresolved data dependency during execution of an instruction (see paragraph 37, lines 1-3), generating a checkpoint that can subsequently be used to return execution to the point of the instruction (see paragraph 38), and executing subsequent instructions in the execute-ahead mode (see paragraph 39).

12. Regarding claim 5, Chaudhry discloses the method of claim 4, wherein if a launch point stall condition is finally resolved, the method further comprises using the

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checkpoint to resume execution in the normal execution mode from the launch point instruction (the instruction that originally encountered the launch point stall condition) (see paragraph 46).

13. Regarding claim 6, Chaudhry discloses the method of claim 1, wherein executing deferred instructions in the deferred mode involves: issuing deferred instructions for execution in program order (see paragraph 40, lines 1-5); deferring execution of deferred instructions that still cannot be executed because of unresolved data dependencies; and executing other deferred instructions that are able to be executed in program order (see paragraph 40, second half).

14. Regarding claim 7, Chaudhry discloses the method of claim 6, wherein if all deferred instructions are executed in the deferred mode, the method further comprises returning to a normal execution mode to resume normal program execution from the point where the execute-ahead mode left off (see paragraph 41).

15. Regarding claim 8, Chaudhry discloses the method of claim 1, wherein the unresolved data dependency can include: a use of an operand that has not returned from a preceding load miss; a use of an operand that has not returned from a preceding translation lookaside buffer (TLB) miss; a use of an operand that has not returned from a preceding full or partial read-after-write (RAW) from store buffer operation; and a use

of an operand that depends on another operand that is subject to an unresolved data dependency (see paragraph 37).

16. Regarding claim 9, Chaudhry discloses the method of claim 1, wherein the non-data-dependent stall condition can include: a memory barrier operation; a load buffer full condition; and a store buffer full condition (see paragraph 43).

17. Claims 10-18 recite equivalent limitations as claims 1-9 respectively and are rejected under the same grounds.

18. Claim 19 recites equivalent limitations as claims 1 and 10 and are rejected under the same grounds of rejections.

19. Claim 20 recites equivalent limitations as claims 2 and 11 and are rejected under the same grounds of rejections.

20. Claim 21 recites equivalent limitations as claims 3 and 12 and are rejected under the same grounds of rejections.

Conclusion

21. The following is text cited from 37 CFR 1.11(c): In amending in reply to a rejection of claims in an application or patent under reexamination, the applicant or patent owner must clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. The applicant or patent owner must also show how the amendments avoid such references or objections.

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jesse R. Moll whose telephone number is (571)272-2703. The examiner can normally be reached on M-F 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fritz M. Fleming can be reached on 571-272-4145. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jesse R Moll
Examiner
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JM 4/27/06

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Supervisory FRITZ FLEMING 4/30/2006
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